

1 1. A circuit for providing a power and control signal selected from a plurality of DC
2 voltage levels and being modulated by an analog AC tone signal to satellite receiver
3 apparatus on a single conductor, comprising:

4 a switch-mode power supply having an input port to which an input voltage is
5 applied, a feedback port responsive to a reference voltage indicative of said selected DC
6 voltage level, and an output port at which a regulated output voltage is provided, wherein
7 said regulated output voltage is greater than said selected DC voltage level by a
8 predetermined amount; and

9 a linear amplifier having an input port coupled to said output port of said switch-
10 mode power supply, a control port to which said reference voltage indicative of said
11 selected DC voltage level is applied, and an output port at which an output voltage
12 having the selected DC voltage level and being modulated by the analog AC tone signal
13 is provided.

1 2. The circuit of claim 1 wherein said satellite receiver apparatus comprises a low
2 noise block converter of a satellite television system.

1 3. The circuit of claim 1 further comprising a signal generator for generating said
2 analog AC tone signal and for applying said analog AC tone signal to said linear
3 amplifier.

1 4. The circuit of claim 1 wherein said switch-mode power supply is a buck
2 converter.

1 5. The circuit of claim 1 wherein said switch-mode power supply is a boost
2 converter.

1 6. The circuit of claim 1 wherein said output port of said linear amplifier comprises
2 a first output port portion and a second output port portion and wherein said output
3 voltage of said linear amplifier is provided at a selected one of said first and second
4 output port portions in response to an output port control signal.

1 7. A method for providing a power and control signal selected from a plurality of DC
2 voltage levels and being modulated by an analog AC tone signal to satellite receiver
3 apparatus on a single conductor, comprising the steps of:

4 selecting one of said plurality of DC voltage levels;
5 providing a regulated output voltage with a switch-mode power supply, said
6 regulated output voltage having a voltage level greater than said selected DC voltage
7 level by a predetermined amount; and
8 applying said regulated output voltage to a linear amplifier, said linear amplifier
9 providing an output voltage having said selected DC voltage level and being modulated
10 by said analog AC tone signal.

1 8. The method of claim 7 further comprising the step of providing said output
2 voltage of said linear amplifier to a low noise block converter of a satellite television
3 system.

1 9. The method of claim 7 further comprising the steps of:
2 generating said analog AC tone signal; and
3 applying said analog AC tone signal to said linear amplifier.

1 10. The method of claim 7 wherein said linear amplifier provides said output voltage at a
2 selected one of a plurality of output ports.

1 11. A circuit for providing a power and control signal selected from a plurality of DC
2 voltage levels and being modulated by an analog AC tone signal to a low noise block
3 converter of a satellite television system on a single coaxial cable, comprising:
4 a switch-mode power supply having an input port to which an input voltage is
5 applied, a feedback port to which a reference voltage indicative of said selected DC
6 voltage level is applied, and an output port at which a regulated output voltage is
7 provided, wherein said regulated output voltage is greater than said reference voltage by a
8 predetermined amount;

9 a linear amplifier having an input port coupled to said output port of said switch-
10 mode power supply, a control port to which said reference voltage indicative of said
11 selected DC voltage level is applied, and an output port at which an output voltage
12 having the selected DC voltage level is provided; and

13 a signal generator for generating said analog AC tone signal and for applying said
14 analog AC tone signal to said linear amplifier, wherein said output voltage of said linear
15 amplifier is modulated by said analog AC tone signal.

1 12. The circuit of claim 11 wherein said switch-mode power supply comprises:

2 an error amplifier having a first input responsive to said reference voltage, a
3 second, feedback input, and an output at which an error signal is provided;

4 a pulse-width-modulation comparator responsive to said error signal for providing
5 a transistor drive signal;

6 a transistor having a first terminal to which said input voltage is applied, a second
7 terminal, and a control terminal responsive to said transistor drive signal; and

8 an inductor having a first terminal coupled to said second terminal of said
9 transistor and a second terminal at which said output voltage of said linear amplifier is
10 provided, wherein said output voltage is coupled to said feedback input of said error
11 amplifier.

1 13. The circuit of claim 12 further comprising an offset voltage generator coupled
2 between said reference voltage and said first input of said error amplifier.

1 14. ¹⁴⁰ circuit of claim 12 wherein said error amplifier and said pulse-width-modulation
2 comparator comprise a current mode pulse-width-modulation controller.